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(54) **VIRTUAL TOUCH-CONTROL LOCK**

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G06K 9/00	(2006.01)
G08B 25/12	(2006.01)
H04W 4/22	(2009.01)

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CPC ***G07C 9/00174*** (2013.01); ***G06K 9/00422*** (2013.01); *G08B 25/12* (2013.01); *H04W 4/22* (2013.01)

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None
See application file for complete search history.

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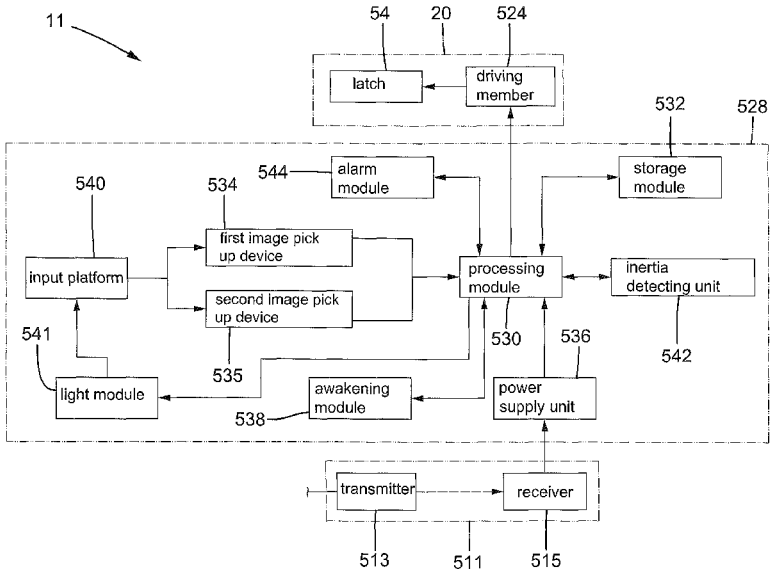
(57) **ABSTRACT**

A virtual touch-control lock includes a processing module electrically connected to a latch device. A storage module, at least one image pick up device, and an input platform including a transparent or non-transparent non-touch-control screen are electrically connected to the processing module. The input platform is configured to permit a user to proceed with handwriting on the input platform and/or touching the input platform. The at least one image pick up device picks up a handwriting trace of the handwriting and/or the touching sequence. The handwriting trace and/or the touching sequence is transmitted to the processing module and is compared with authorized door-opening identification information stored in the storage module. The identification result is used to control movement of a latch of the latch device from the latching position to the unlatching position or to permit the latch to move from the latching position to the unlatching position.

8 Claims, 2 Drawing Sheets



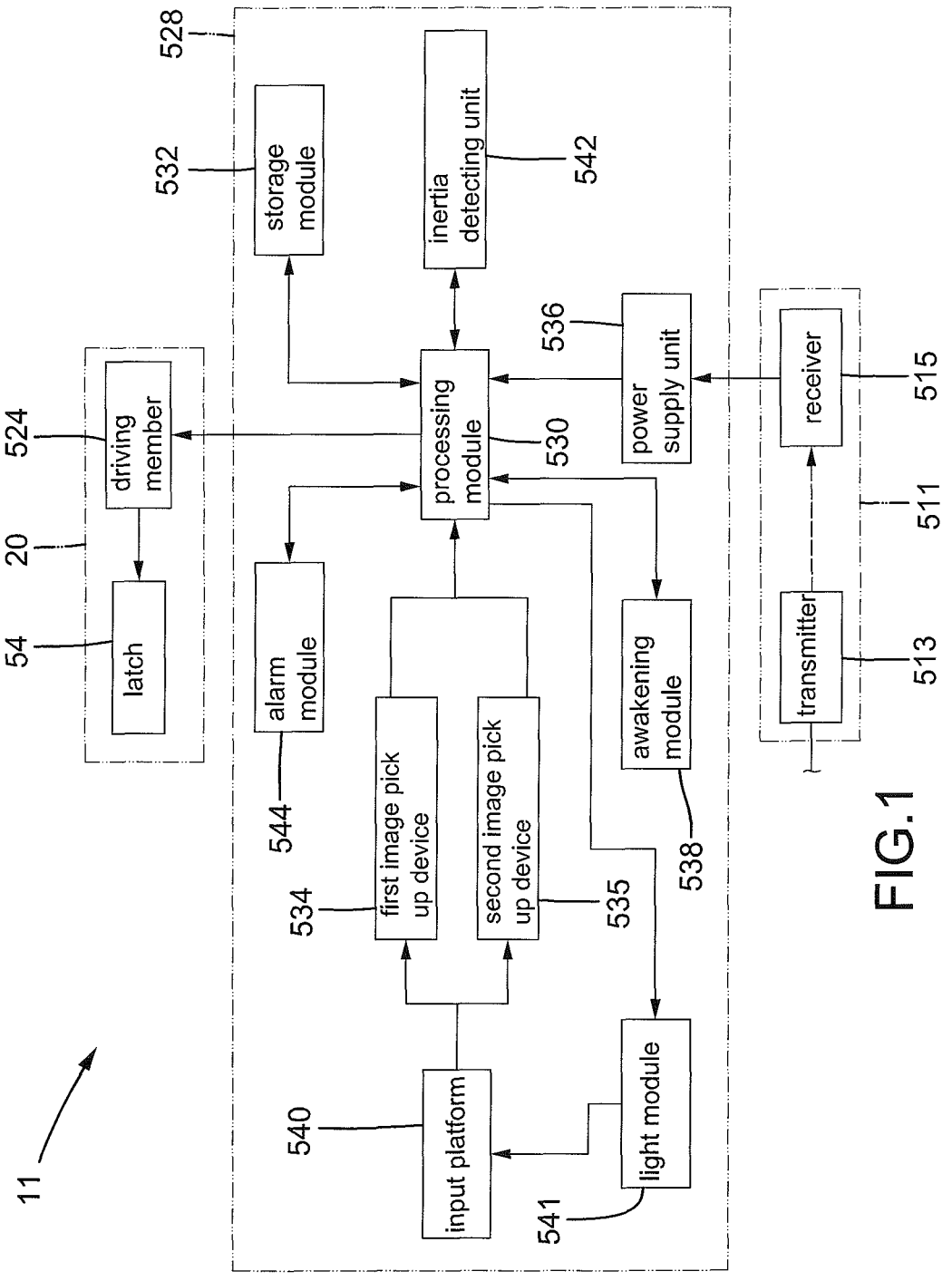

528
532
storage module
inertia detecting unit
542
536
power supply unit
receiver
515
524
driving member
processing module
530
20
511
54
latch
alarm module
awakening module
transmitter
513
544
first image pick up device
second image pick up device
534
535
538
540
input platform
light module
541
11

FIG. 1

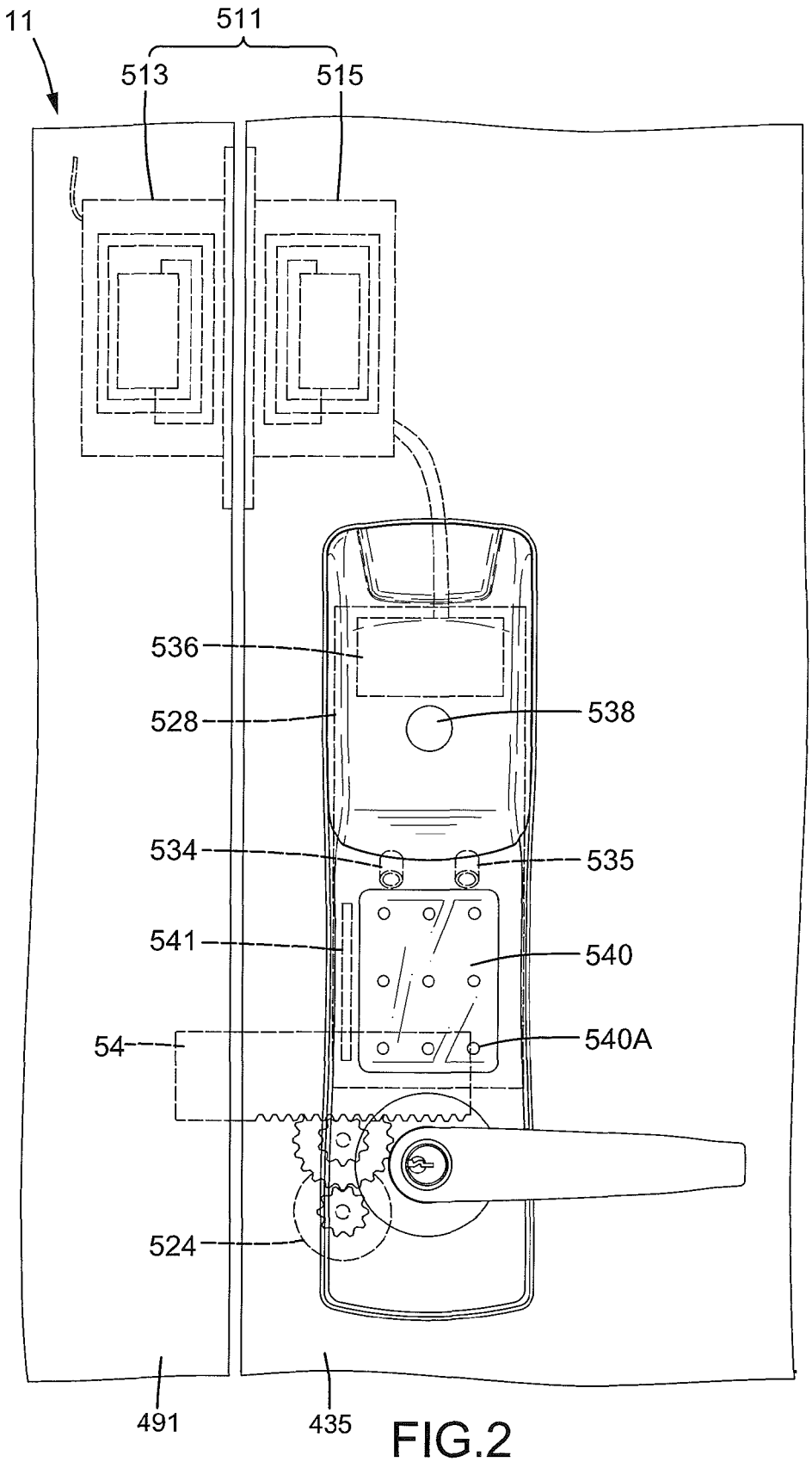


FIG.2

VIRTUAL TOUCH-CONTROL LOCK

BACKGROUND OF THE INVENTION

The present invention relates to a virtual touch-control lock and, more particularly, to a virtual touch-control lock using a transparent or non-transparent input platform of a non-touch-control screen as an input interface and cooperating with at least one image pick up device for picking up images to permit unlocking control of a lock through handwriting on or touching the transparent or non-transparent input platform.

Conventional mechanical locks have been well developed, and metal keys are generally required to open most types of the mechanical locks, such that many people have to carry various keys for different locks and have to remember the corresponding lock of each key, which is inconvenient in carriage and use. With the progress of technology, conventional mechanical locks have been gradually developed to include motors or magnetically driven devices to activate the components of the locks, while cooperating electrical identity identification processes control locking or unlocking of the locks.

One type of the most commonly used electric locks uses radio frequency identification (RFID) technology to identify the identity of the user. Specifically, when the user carrying an induction card is near the electric lock, the electric lock reads an identification number stored in the induction card and compares the identification number of the induction card with a list of authorized identification numbers stored in the electric lock. If the identification number of the induction card matches any one of the authorized identification numbers, the electric lock is unlocked. On the other hand, if the identification number of the induction card does not match any one of authorized identification numbers, the electric lock remains locked. It is obvious that the electric lock remains locked if the user is without an induction card. Since the electric lock using RFID may require remote control (and is, thus, more suitable for public areas) and since the control of authorization or cancellation of the authorization of the induction card is complicated, the electric lock using RFID is not suitable for houses or non-public areas.

Furthermore, operation of electric locks requires electricity. Taking a door lock using RFID as an example, since the door can pivot, it is not easy to directly use the main power supply as the power source for the RFID door lock. Thus, a battery is mounted in the door lock to provide electricity to the RFID door lock. However, the RFID door lock intermittently emits signals to detect whether an induction card is nearby, such that the battery power could not support long-term operation of the RFID door lock without replacement of the battery.

Furthermore, locks, which are generally used against burglary, cannot generate an alarm signal while the locks are being destroyed by thieves, such as by using a hammer, such that the users cannot know the locks are being destroyed.

BRIEF SUMMARY OF THE INVENTION

To fix the above problems, the present invention provides a virtual touch-control lock including a latch device having a latch movable between a latching position and an unlatching position. The latch device further includes a driving member connected to the latch. The driving member can be operated to move the latch between the latching position and the unlatching position or to permit the latch to move between the latching position and the unlatching position. A processing module is electrically connected to the driving member and controls operation of the driving member. A storage module is electrically connected to the processing module. Authorized door-opening identification information including at least one of a handwriting trace and a touching sequence is stored in the storage module. A first image pick up device is electrically connected to the processing module. An input platform including a transparent or non-transparent non-touch-control screen is mounted outside of the first image pick up device. The input platform is configured to permit a user to proceed with at least one of handwriting on the input platform and touching the input platform. A power supply unit is electrically connected to the processing module and provides electricity to the processing module during operation. The power supply unit provides electricity required for operation of the driving member, the storage module, and the first image pick up device under control of the processing module.

When a user proceeds with at least one of handwriting on the input platform and touching the input platform, the first image pick up device picks up a handwriting trace of the handwriting and/or a touching sequence of the touching and transmits the handwriting trace and/or the touching sequence to the processing module. The processing module compares the handwriting trace and/or the touching sequence inputted from the first image pick up device with the authorized door-opening identification information stored in the storage module.

When the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first image pick up device does not match the authorized door-opening identification information stored in the storage module, the driving member is not activated, and the latch remains in the latching position.

When the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first image pick up device matches the authorized door-opening identification information stored in the storage module, the driving member is activated to move the latch from the latching position to the unlatching position or to permit the latch to move from the latching position to the unlatching position.

The virtual touch-control lock can further include an awakening module electrically connected to the processing module. The power supply, unit provides electricity required for operation of the awakening module under control of the processing module. The awakening module is adapted to detect whether a person is near the input platform. When the awakening module detects that nobody is near the input platform, the processing module controls the first image pick up device to stop. On the other hand, when the awakening module detects that a person is near the input platform, the processing module controls the first image pick up device to operate.

The virtual touch-control lock can further include a second image pick up device electrically connected to the processing module. When the awakening module detects that nobody is near the input platform, the processing module controls the first and second image pick up devices to stop. On the other hand, when the awakening module detects that a person is near the input platform, the processing module controls the first and second image pick up devices to operate.

The virtual touch-control lock can further include an inertia detecting unit and an alarm module. The inertia detecting unit is electrically connected to the processing module. The power supply unit provides electricity required for operation of the inertia detecting unit under control of the processing module. The alarm module is electrically connected to the processing module. The power supply unit provides electricity required for operation of the alarm module under control of the processing module. When the awakening module

detects that nobody is near the input platform, the processing module controls the inertia detecting unit to stop. On the other hand, when the awakening module detects that a person is near the input platform, the processing module controls the inertia detecting unit to operate. When the inertia detecting unit detects vibrations of the virtual touch-control lock, the inertia detecting unit outputs a signal to the processing module to activate the alarm module, and the alarm module generates an alarm message. On the other hand, when the inertia detecting unit detects no vibrations of the virtual touch-control lock, the inertia detecting unit does not output the signal to the processing module, and the alarm module is not activated.

The virtual touch-control lock can further include a light module mounted in the input platform and electrically connected to the processing module. When the awakening module detects that nobody is near the input platform, the processing module controls the light module to stop. On the other hand, when the awakening module detects that a person is near the input platform, the processing module controls the light module to illuminate the input platform.

The latch device is adapted to be mounted to a door. The power supply unit can be a battery. The virtual touch-control lock can further include a receiver and a transmitter. The receiver is electrically connected to the battery and is adapted to be mounted on the door. The transmitter is adapted to be electrically connected to the city power, is adapted to be mounted to a door frame to which the door is pivotably mounted, and is adapted to transmit a wireless signal. When the door is open, the receiver is outside of a signal range of the wireless signal of the transmitter, such that the receiver cannot charge the battery. When the door is closed, the receiver is within the signal range of the transmitter, such that the receiver converts the wireless signal from the transmitter into an electric current to charge the battery.

Each of the first and second image pick up devices can be mounted above the input platform and can be at an angle not equal to 90° to a surface of the input platform. Each of the first and second image pick up devices has a lens facing downwards.

The present invention will become clearer in light of the following detailed description of illustrative embodiments of this invention described in connection with the drawings.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block view of a virtual touch-control lock of an embodiment according to the present invention.

FIG. **2** is a partial, plan view of a door on which the virtual touch-control lock is mounted.

All figures are drawn for ease of explanation of the basic teachings only; the extensions of the figures with respect to number, position, relationship, and dimensions of the parts to form the illustrative embodiments will be explained or will be within the skill of the art after the following teachings have been read and understood. Further, the exact dimensions and dimensional proportions to conform to specific force, weight, strength, and similar requirements will likewise be within the skill of the art after the following teachings have been read and understood.

Where used in the various figures of the drawings, the same numerals designate the same or similar parts. Furthermore, when the terms "first", "second", "side", "downwards", "above", "inside", "outside", and similar terms are used herein, it should be understood that these terms have reference only to the structure shown in the drawings as it would appear to a person viewing the drawings and are utilized only to facilitate describing the illustrative embodiments.

DETAILED DESCRIPTION OF THE INVENTION

With reference to FIGS. **1-2**, a virtual touch-control lock **11** of an embodiment according to the present invention is illustrated as a door lock mounted to a door **435**. Specifically, in this embodiment, the virtual touch-control lock **11** includes a latch device **20** mounted to the door **435** and having a mechanical structure. The latch device **20** can be of any desired form as conventional including but not limited to of a commercially available type. The latch device **20** includes a latch **54** that can be controlled to move between a latching position at least partially outside of the door **435** and an unlatching position inside the door **435**. The latch device **20** further includes a driving member **524** connected to the latch **54**. In an example, the driving member **524** is comprised of a motor and a gear train between the motor and the latch **54** (see FIG. **2**). The latch **54** includes a rack meshed with the gear train. Thus, the latch **54** moves between the latching position and the unlatching position when the driving member **524** operates.

In this embodiment, the virtual touch-control lock **11** further includes a virtual touch-control device **528** electrically connected to the driving member **524** of the latch device **20**. The virtual touch-control device **528** includes a processing module **530** electrically connected to the driving member **524**. The processing module **530** controls operation of the driving member **524**. The virtual touch-control device **528** further includes a storage module **532** electrically connected to the processing module **530**. Authorized door-opening identification information including at least one of a handwriting trace and a touching sequence is stored in the storage module **532**.

In this embodiment, the virtual touch-control device **528** further includes first and second image pick up devices **534** and **535** electrically connected to the processing module **530**. The first and second image pick up devices **534** and **535** are connected in parallel. The virtual touch-control device **528** further includes an awakening module **538** electrically connected to the processing module **530**. The awakening module **538** is adapted to detect whether a person is near the virtual touch-control lock **1***t*. In an example, the awakening module **538** can use an infrared light source and an optical sensor. When nobody is near the virtual touch-control lock **11**, the infrared ray will not be reflected to the optical sensor. When the awakening module **538** detects that nobody is near the virtual touch-control lock **11**, the processing module **530** controls the first and second image pick up devices **534** and **535** to stop. On the other hand, the awakening module **538** detects that a person is near the virtual touch-control lock **11**, the processing module **530** controls the first and second image pick up devices **534** and **535** to operate.

In this embodiment, the virtual touch-control device **528** further includes an input platform **540** including a transparent or non-transparent non-touch-control screen, such as a light guiding board. The input platform **540** includes an outer surface having a plurality of marks **540**A. The input platform **540** is mounted outside of the first and second image pick up devices **534** and **535**. Each of the first and second image pick up devices **534** and **535** is mounted above the input platform **540** and is at an angle not equal to 90° to the outer surface of the input platform **540**, such that each of the first and second image pick up devices **534** and **535** can pick up the image of the whole input platform **540**. Each of the first and second

image pick up devices **534** and **535** has a lens facing downwards and facing the input platform **540**.

In this embodiment, a light module **541** is mounted at a side of the input platform **540** and is electrically connected to the processing module **530**. When the awakening module **538** detects that a person is near the input platform **540**, the processing module **530** controls the light module **541** to illuminate the input platform **540**. On the other hand, when the awakening module **538** detects that nobody is near the input platform **540**, the processing module **530** controls the light module **541** to stop.

The input platform **540** is configured to permit a user to proceed with at least one of handwriting on the input platform **540** and touching the input platform **540**. Handwriting includes movement of a finger that keeps touching the input platform **540** to draw a figure, a symbol, a letter, etc. The marks **540**A serve as reference points for the movement of the finger. As an example, a trace that can more easily be identified by the processing module **530** can be generated in a specific area of the input platform **540** after the finger touches any, one of the marks **540**A and then moves on the input platform **540** to another mark **540**A. Thus, the first and second image pick up devices **534** and **535** can pick up the images of the trace resulting from the handwriting.

Touching includes using a finger to touch any one of the marks **540**A on the input platform **540**, moving the finger away from the input platform **540**, and then touching another mark **540**A. The finger can touch the same or different marks **540**A several times. The first and second image pick up devices **534** and **535** pick up the images of the touching sequence of the marks **540**A.

In addition to providing a light source to indicate the position of the input platform **540** and to provide illumination for the user, the light module **541** also provide sufficient luminance for the first and second image pick up devices **534** and **535**. Thus, the first and second image pick up devices **534** and **535** can obtain high quality images of the handwriting trace and/or the touching sequence, improving the identification success rate of the processing module **530**.

In this embodiment, the virtual touch-control device **528** further includes an inertia detecting unit **542** electrically connected to the processing module **530** and an alarm module **544**, such as a buzzer, electrically connected to the processing module **530**. The inertia detecting unit **542** can include a digital three-axis accelerator. The inertia detecting unit **542** is used to detection vibrations of the virtual touch-control lock **11** for the purposes of identifying whether a burglar is destroying the virtual touch-control lock **11**. When the inertia detecting unit **542** detects vibrations of the virtual touch-control lock **11**, the inertia detecting unit **542** outputs a signal to the processing module **530** to activate the alarm module **544**, and the alarm module **544** generates an alarm message, such as a siren.

In this embodiment, the virtual touch-control device **528** further includes a power supply unit **536** electrically connected to the processing module **530**. The power supply unit **2536** can be a battery. The power supply unit **536** provides electricity required for operation of the first and second image pick up devices **534** and **535**, the awakening module **538**, the inertia detecting unit **542**, the storage module **532**, the light module **541**, and the driving member **524** under control of the processing module **530**.

In this embodiment, the virtual touch-control lock **11** further includes a wireless charging device **511**. The wireless charging device **511** includes a receiver **515** electrically connected to the power supply unit **536**. The receiver **515** is adapted to be mounted to the door **435**, such as mounted inside the door **435**. The wireless charging device **511** further includes a transmitter **513** adapted to be electrically connected to the city power, adapted to be mounted to a door frame **491** to which the door **435** is pivotably mounted, and adapted to transmit a wireless signal. When the door **435** is open, the receiver **515** is outside of a signal range of the wireless signal. On the other hand, when the door **435** is closed, the receiver **515** is within the signal range of the transmitter **513**.

Now that the basic construction of the virtual touch-control lock **11** has been explained, the operation and some of the advantages of the virtual touch-control lock **11** can be set forth and appreciated. In particular, for the sake of explanation, it will be assumed that the door **435** is closed and the latch **54** is in the latching position. Since the receiver **515** is within the signal range of the transmitter **513**, the receiver **515** converts the wireless signal from the transmitter **513** into an electric current to charge the power supply unit **536**. The latch **54** in the latching position is engaged in a receptacle in the door frame **491** to prevent opening of the door **435**.

With the door **435** in the closed state, when the awakening module **538** detects that nobody is near the input platform **540**, the processing module **530** controls the first and second image pick up devices **534** and **535**, the light module **541**, and the inertia detecting unit **542** to stop, thereby saving electricity. Furthermore, when the awakening module **538** detects that nobody is near the virtual touch-control lock **11**, the processing module **530** can control the storage module **532**, the inertia detecting unit **542**, and the alarm module **544** to stop, further saving electricity. Note that even if the awakening module **538** detects that nobody is near the virtual touch-control lock **11**, the processing module **530** still controls the power supply unit **536** to supply electricity to the awakening module **538**, such that the awakening module **538** can continuously detect whether a person is near the virtual touch-control lock **11**.

When the door **435** is in the closed state, if the awakening module **538** detects that a person is near the input platform **540**, the processing module **530** controls the first and second image pick up devices **534** and **535**, the light module **541**, and the inertia detecting unit **542** to operate. The light module **541** illuminates the input platform **540**. The first and second image pick up devices **534** and **535** start the image pick up operation. The inertia detecting unit **542** detects whether abnormal vibrations of the virtual touch-control lock **11** occur to identify whether the virtual touch-control lock **11** is being destroyed. If the inertia detecting unit **542** detects abnormal vibration, the alarm device **544** is activated to generate an alarm message.

On the other hand, if the inertia detecting unit **542** detects no abnormal vibrations of the virtual touch-control lock **11**, the alarm module **544** is not activated. The first and second image pick up devices **534** and **535** pick up the handwriting trace of the handwriting and/or the touching sequence of the touching and transmit the handwriting trace and/or the touching sequence to the processing module **530**. The processing module **530** compares the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices **534** and **535** with the authorized door-opening identification information stored in the storage module **532**.

If the processing module **530** identifies that the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices **534** and **535** does not match the authorized door-opening identification information stored in the storage module **532**, the driving member **524** is not activated, and the latch **54** remains in the latching position not permitting opening of the door **435**.

On the other hand, if the processing module **530** identifies that the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices **534** and **535** matches the authorized door-opening identification information stored in the storage module **532**, the driving member **524** is activated to move the latch **54** from the latching position to the unlatching position, permitting opening of the door **435**.

When the latch **54** is in the unlatching position and when the door **435** is opened, the receiver **515** is outside of the signal range of the wireless signal of the transmitter **513**, such that the receiver **515** stops charging the power supply unit **536**.

The virtual touch-control lock **11** uses the input platform **540** having a non-touch-control screen and the first and second image pick up devices **534** and **535** to achieve the handwriting function and the touch control function, avoiding use of expensive touch-control screens to save the manufacturing costs.

The virtual touch-control lock **11** uses the inertia detecting unit **542** to cooperate with the alarm module **544** and the awakening module **538** for detecting whether the person near the virtual touch-control lock **11** is destroying the virtual touch-control lock **11**. Furthermore, the alarm module **544** is activated when the virtual touch-control lock **11** is being destroyed by an external force.

The virtual touch-control lock **11** uses the awakening module **538** to detect whether a person is near the virtual touch-control lock **11**. In a case that nobody is near the virtual touch-control lock **11**, the first and second image pick up devices **534** and **535**, the light module **541**, and the inertia detecting unit **542** stop operation to save electricity.

The virtual touch-control lock **11** uses the receiver **515** of the wireless charging device **511** to charge the power supply unit **536** when the door **435** is closed, greatly reducing the replacement frequency of the power supply unit **536**.

Now that the basic teachings of the present invention have been explained, many extensions and variations will be obvious to one having ordinary skill in the art. For example, the virtual touch-control lock **11** does not have to include the second image pick up device **535**. The first image pick up device **534** can be mounted to be perpendicular to the input platform **540** to pick up the handwriting trace and/or the touching sequence. Furthermore, the virtual touch-control lock **11** does not have to include the awakening module **538**. In this case, the overall costs for the input platform **540** formed by a light guiding board and for the first and second image pick up devices **534** and **535** are still lower than the costs for a touch-control screen, although the first and second image pick up devices **534** and **535**, the input platform **540**, and the inertia detecting unit **542** keep consuming electricity.

Furthermore, although the driving member **524** in the form shown is directly connected to the latch **54** to move the latch **54** between the latching position and the unlatching position, operation of the driving member **524** does not have to actuate the latch **54**. For example, the driving member **524** can be of a type movable between a first position not blocking movement of the latch **54** between the latching and unlatching positions and a second position blocking movement of the latch **54** between the latching and unlatching positions.

Thus since the illustrative embodiments disclosed herein may be embodied in other specific forms without departing from the spirit or general characteristics thereof, some of which forms have been indicated, the embodiments described herein are to be considered in all respects illustrative and not restrictive. The scope is to be indicated by the appended claims, rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

The invention claimed is:

1. A virtual touch-control lock comprising:

a latch device including a latch movable between a latching position and an unlatching position, with the latch device further including a driving member connected to the latch, and with the driving member operable to move the latch between the latching position and the unlatching position or to permit the latch to move between the latching position and the unlatching position;

a processing module electrically connected to the driving member, with the processing module controlling operation of the driving member;

a storage module electrically connected to the processing module, wherein authorized door-opening identification information including at least one of a handwriting trace and a touching sequence is stored in the storage module;

a first image pick up device electrically connected to the processing module;

an input platform including a transparent or non-transparent non-touch-control screen, with the input platform mounted outside of the first image pick up device, with the input platform configured to permit a user to proceed with at least one of handwriting on the input platform and touching the input platform; and

a power supply unit electrically connected to the processing module and providing electricity to the processing module during operation, with the power supply unit providing electricity required for operation of the driving member, the storage module, and the first image pick up device under control of the processing module,

wherein when a user proceeds with at least one of handwriting on the input platform and touching the input platform, the first image pick up device picks up a handwriting trace of the handwriting and/or a touching sequence of the touching and transmits the handwriting trace and/or the touching sequence to the processing module, and the processing module compares the handwriting trace and/or the touching sequence inputted from the first image pick up device with the authorized door-opening identification information stored in the storage module,

wherein when the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first image pick up device does not match the authorized door-opening identification information stored in the storage module, the driving member is not activated, and the latch remains in the latching position, and

wherein when the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first image pick up device matches the authorized door-opening identification information stored in the storage module, the driving member is activated to move the latch from the latching position to the unlatching position or to permit the latch to move from the latching position to the unlatching position.

2. The virtual touch-control lock as claimed in claim **1**, further comprising:

an awakening module electrically connected to the processing module, with the power supply unit providing electricity required for operation of the awakening module under control of the processing module, and with the awakening module adapted to detect whether a person is near the input platform,

wherein when the awakening module detects that nobody is near the input platform, the processing module controls the first image pick up device to stop, and

wherein when the awakening module detects that a person is near the input platform, the processing module controls the first image pick up device to operate.

3. The virtual touch-control lock as claimed in claim **2**, further comprising a second image pick up device electrically connected to the processing module,

wherein when the awakening module detects that nobody is near the input platform, the processing module controls the first and second image pick up devices to stop, and

wherein when the awakening module detects that a person is near the input platform, the processing module controls the first and second image pick up devices to operate.

4. The virtual touch-control lock as claimed in claim **2**, further comprising:

an inertia detecting unit electrically connected to the processing module, with the power supply unit providing electricity required for operation of the inertia detecting unit under control of the processing module;

an alarm module electrically connected to the processing module, with the power supply unit providing electricity required for operation of the alarm module under control of the processing module,

wherein when the awakening module detects that nobody is near the input platform, the processing module controls the inertia detecting unit to stop,

wherein when the awakening module detects that a person is near the input platform, the processing module controls the inertia detecting unit to operate,

wherein when the inertia detecting unit detects vibrations of the virtual touch-control lock, the inertia detecting unit outputs a signal to the processing module to activate the alarm module, and the alarm module generates an alarm message, and

wherein when the inertia detecting unit detects no vibrations of the virtual touch-control lock, the inertia detecting unit does not output the signal to the processing module, and the alarm module is not activated.

5. The virtual touch-control lock as claimed in claim **2**, further comprising a light module mounted in the input platform and electrically connected to the processing module,

wherein when the awakening module detects that nobody is near the input platform, the processing module controls the light module to stop, and

wherein when the awakening module detects that a person is near the input platform, the processing module controls the light module to illuminate the input platform.

6. The virtual touch-control lock as claimed in claim **1**, with the latch device adapted to be mounted to a door, with the power supply unit being a battery, with the virtual touch-control lock further comprising:

a receiver electrically connected to the battery, with the receiver adapted to be mounted on the door; and

a transmitter adapted to be electrically connected to city power, with the transmitter adapted to be mounted to a door frame to which the door is pivotably mounted, and with the transmitter adapted to transmit a wireless signal,

wherein when the door is open, the receiver is outside of a signal range of the wireless signal of the transmitter, such that the receiver cannot charge the battery, and

wherein when the door is closed, the receiver is within the signal range of the transmitter, such that the receiver converts the wireless signal from the transmitter into an electric current to charge the battery.

7. The virtual touch-control lock as claimed in claim **1**, further comprising:

a second image pick up device electrically connected to the processing module,

wherein when the user proceeds with at least one of handwriting on the input platform and touching the input platform, the first and second image pick up devices pick up the handwriting trace of the handwriting and/or the touching sequence of the touching and transmit the handwriting trace and/or the touching sequence to the processing module, and the processing module compares the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices with the authorized door-opening identification information stored in the storage module,

wherein when the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices does not match the authorized door-opening identification information stored in the storage module, the driving member is not activated, and the latch remains in the latching position, and

wherein when the latch is in the latching position, if the handwriting trace and/or the touching sequence inputted from the first and second image pick up devices matches the authorized door-opening identification information stored in the storage module, the driving member is activated to move the latch from the latching position to the unlatching position or to permit the latch to move from the latching position to the unlatching position.

8. The virtual touch-control lock as claimed in claim **7**, wherein each of the first and second image pick up devices is mounted above the input platform and is at an angle not equal to 90° to a surface of the input platform, and each of the first and second image pick up devices has a lens facing downwards.

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